

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus for transmitting a sequence for channel estimation in a mobile communication system including M transmission antennas, P encoders for receiving P information bit streams and encoding the received P information bit streams with a space-time trellis code (STTC), and M modulators for modulating information bit streams output from the P encoders in a predetermined modulation scheme and outputting modulation symbol streams, the apparatus comprising:

a sequence generator for generating the sequence for the channel estimation;

M puncturers for puncturing at least one modulation symbol in a predetermined position for each of the modulation symbol streams output from the M modulators, and inserting the sequence in the at least one punctured modulation symbol; and

M multiplexers individually connected to the M transmission antennas, for multiplexing signals output from the M puncturers and the sequence inserted in the position of at least one of the punctured modulation symbol and transmitting the non-punctured modulation symbol with the sequence in the time period in which the sequence is transmitted.

2. (Original) The apparatus of claim 1, wherein the M puncturers each have a same number of modulation symbols where the sequence is inserted, for the modulation symbol streams output from the M modulators.

3. (Original) The apparatus of claim 1, wherein the M puncturers each periodically repeat a position where the sequence is inserted, for the modulation symbol streams output from the M modulators.

4. (Original) The apparatus of claim 1, wherein the sequence is a pilot sequence.

5. (Original) The apparatus of claim 4, wherein a frame format transmitted through each of the M transmission antennas is set so that the M transmission antennas have different positions where the pilot sequence is inserted.

Claim 6. (Currently Amended) The apparatus of claim 1, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 4, a position where the sequence is inserted is determined according to a puncturing matrix P_1 defined as

$$P_1 = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element $[[\text{"0."}]]$ "0".

Claim 7. (Currently Amended) The apparatus of claim 1, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 6, a position where the sequence is inserted is determined according to a puncturing matrix P_2 defined as

$$P_2 = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element $[[\text{"0."}]]$ "0".

8. (Currently Amended) A method for transmitting a sequence for channel estimation in a mobile communication system including M transmission antennas, P encoders for receiving P information bit streams and encoding the received P information bit streams with a space-time trellis code (STTC), and M modulators for modulating information bit streams output from the P encoders in a predetermined modulation scheme and outputting modulation symbol streams, the method comprising the steps of:

generating the sequence for the channel estimation; ~~and~~

puncturing at least one modulation symbol in a predetermined position for each of the modulation symbol streams output from the M modulators;

inserting the sequence in the position of at least one of the punctured modulation symbol;
and

~~transmitting the sequence in substitute for at least one modulation symbol in a predetermined position through the M transmission antennas, for each of the modulation symbol~~

streams output from the M modulators the non-punctured modulation symbol with the sequence in the time period in which the sequence is transmitted.

9. (Original) The method of claim 8, wherein number of sequences inserted in modulation symbol streams output from the M modulators are identical.

10. (Original) The method of claim 8, wherein the predetermined position where the sequence is inserted is periodically repeated for modulation symbol streams output from the M modulators.

11. (Original) The method of claim 8, wherein the sequence is a pilot sequence.

Claim 12. (Currently Amended) The method of claim 8, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 4, the predetermined position where the sequence is inserted is determined according to a puncturing matrix P_1 defined as

$$P_1 = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element $[[\text{"0."}]]$ "0".

13-20. (Cancelled)